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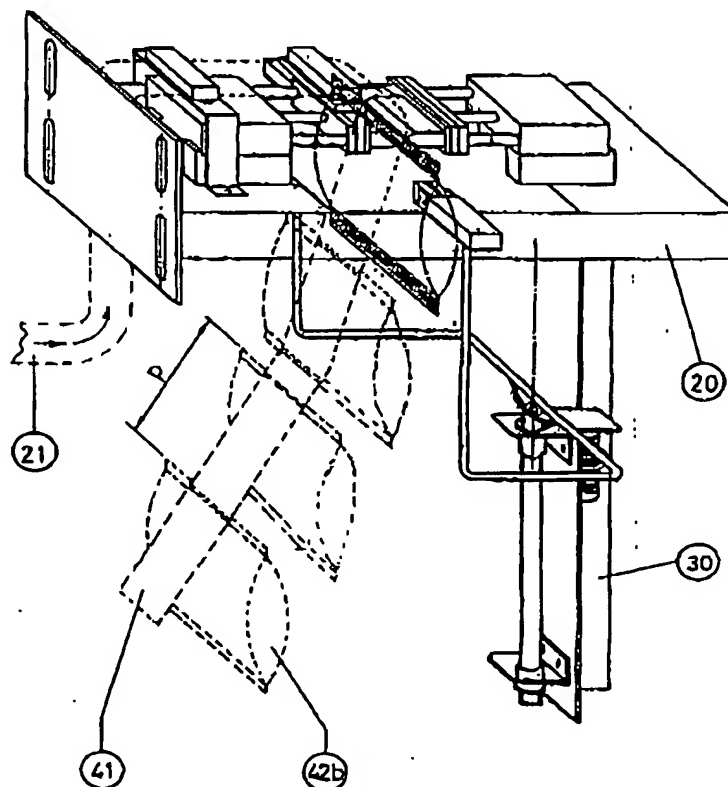
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(54) Title: APPARATUS FOR SECURING FLEXIBLE PACKAGES TO A DISPLAY STRIP

(57) Abstract

It is a system in which a desired number of flexible packages can be attached on the display strip successively to be more detachable and neither the strip nor the package gets damaged when detaching. Stripping process: the package of which process is completed with the packing machine is held by two reciprocal pneumatic grippers, and carried to a second station where it is sealed to the strip by means of small jaws under heat and pressure.



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APPARATUS FOR SECURING FLEXIBLE PACKAGES TO A DISPLAY STRIP

2- BACKGROUND OF THE INVENTION

2.a- The Title Of The Invention :

5 The fixing of flexible packages made by Vertical or horizontal form fill and seal packaging machines with a strip after being packed on a second station in the same machine by the help of small jaws, using the method of with heat and pressure in a way that they could easily be removed from the strip; shortly names as THE METHOD AND APPARATUS FOR
10 THE AUTOMATED ATTACHMENT OF DETACHABLY SECURING FLEXIBLE PACKAGES TO A DISPLAY STRIP, FROM WHICH THEY COULD EASILY BE TAKEN WITHOUT ANY DAMAGE, IS PERFORMED AT THE SECOND STATION OF THE TYPE VERTICALLY OR HORIZANTALLY FORM FILL SEAL PACKAGING MACHINE.

2.b- Field Of The Invention :

15 The invention involves the area;
Outlets like supermarkets, markets, shops and nutssshops, where packages of appetizers like dried fruits, sunflower seeds, chips (potato, corn, tortilla, fabricated), extruded snacks and nuts are sold, utilize some methods in displaying their products. One of these methods is hanging packages strips arranged in a line. This method will be preferred by both the
20 sellers who have small shops because it makes arrangement and displaying easier and the consumers who can easily make their choice.
However, the present condition of the technique is a terrible expense for the producer and a painstaking procedure for the consumer. The packets should be safely arranged so that they will not fall down; they should only be taken by pulling downwards and neither the package nor the strip should be damaged in the meantime and nor the packages on the
25 strip should be dropped.

The Present Condition Of The Technique :

30 The packages mentioned are usually produced in vertical or horizontal form fill and seal packing machines. The bottom of the packages is sealed at a speed of 15 -120 packages per minute using only one of the materials like polyethylene, polypropylene, cellophane, aluminium follo and bi-oriented polypropylene (bopp) (or several of them are laminated) and by the help of pneumatic, hydraulic or mechanical pressure properly selected for the material; the packages are filled and the tops are closed by sealing and cut and taken away
35 from the machine by a conveyor which stands just below the packing machine. The packages taken away from the packing machine by a conveyor are unloaded into a second station where the packages are lined up on perforated cardboard strips by at least three manual workers. (Fig.5 Pos.M1, M2)
In a middle-sized factory with 15-25 packing machines, the number of workers needed is
40 45-75 in one shift and 135-225 in three shifts. Besides waste of labour and the difficulties it brings to the worker, the increasing expense is unaffordable for both the consumer and the manufacturer.
For this reason, the experts in many countries in the world have been working on this subject for years.
45 Some examples patented in the USA and our opinions about them and the advantages of our invention when compared to others are as follows.
Palmer U.S. Pat. No. 4.422.552 et al. and Palmer U.S. Pat.No.4.476.619 disclose methods and apparatus for folding the end seal or flange of a bag into the slot of a display card. The steps of folding and tucking the end seals of numerous packages into a slotted display card are often performed manually and consume considerable time and expense. The prior
50 art, however, includes alternative methods of attaching flexible packages to a display card.
For example, Runner U.S. Pat.No.2.272.623 discloses a display card with packages removably attached thereto by adhesive. In Farfelly U.S.Pat.No.4.003.782 manufactured bags are applied to two lines of pressure sensitive adhesive and then stored in a carton or the like. It is also known to attach empty packages to a display or mounting support base
55 and then fill and seal the packages.
See Hannon U.S.Pat.No.3.331.182 . Several problems arise with the aforementioned methods of securing packages to a display strip. One problem that often occurs when the

packages are adhesively attached to the display strip is that the packages cannot easily be removed from the strip without damaging the sealed condition of the packages.

In Patrea's patent with no. 3.864.895 in the USA only the packages made in vertical packing machine are glued onto the strip on a second station by a vacuumed arms on the conveyor.

Finally in Recot Inc.'s patent with no. 5.433.060 in the USA, the system of sealing the packages on strips under pressure and heat. Since in Recot's patent the packages are ripped from the strip, there are some cases where the packages, the strip and the hanger might be damaged, and also the other packages fall down.

In this invention; in the system which is based on this applied method has some differences and superiorities which are explained in details below compared to Recot Inc.'s patent in the USA with no. 5.433.060.

a) As mentioned in Recot's claim no.1, the sealing of the packages on the strip under pressure and heat is not a recent invention, because announcements for promotion have been made ever since by sealing strips onto packages. A similar application can be seen in case of potato and fruit bags.

b) It's known by those who know the subject well that the loosening of the joining parts and different wearing might cause serious problems because there is a mechanical damage on every package made in jaws which are constantly warming and cooling and the additional parts are not rigid. This will bring some disadvantages as below.

- When the additional part gets loose, the sealing of the strip or the package gets very strong and the packages can hardly be separated from the strip, therefore the package, the strip and the system of hangings might be damaged; or when the sealing is too loose the packages might be dropped by the wind or another effect.

c) In feeding the strip, as Recot suggests, a step motor or a pneumatic system should be used; in other words there is a system pushing the strip by certain steps. In our invention, the strip is prepared with a system that has a function of positive pulling by means of bellowed pitch piston assembled on a small jaw group. Therefore there is no need for the step motor and the necessary micro processor commanding it an electronic circuit anymore. (like PLC)

d) As seen in Recot's patent in question FIG.5 Pos N1 and N2, there is a risk of ripping the package open as a result of pulling downwards. To prevent this, the strip should be held by the bottom side and the package should be lifted up, but it is not usually practised, also a shaking movement made to rip the packages off the strip may cause the other packages to free from the pawl. However, in our invention, as shown in FIG.5 Pos.01 and 02, because the packages are adversely twisted on the strip, they are not sealed on the adhesive part but pulled downwards. As a result the procedure which the consumer follows is not a kind of ripping but releasing the packet from the strip.

There for the packages could simply be released from the strip without damaging the package, the strip and the system of hangings.

e) The strip should be cut into certain lengths so as to be placed successively in a row. In Recot's patent, since there are not any measures taken for this operation, the product should be counted by a worker before cutting. In this invention, however, the required number of packages are automatically cut after being attached on the strip and then reaches the worker who places the strips in cases and sends them to the store for the purpose of being delivered to outlets.

2.c. The Technical Problems Which The Invention Aims To Solve And Secondary Goals

With this invention, the stripping process that is mentioned at the item 2-e is carried out automatically and brings a solution for the following problems.

a) A great number of workers work on the packing area which is quite narrow and uncomfortable.

b) The workers who work at the machines repeat a monotonous and boring action thousands of times.

c) The cardboard which is still consumed as strips is first prepared, obtained and then produced.

- d) During the process from production to delivery (unloading-storing- transfer- unloading-storing- loading etc.) packages slip out of cardboard strips (FIG.5 Pos. M1, M2) at the point where strips are locked by hand due to external factors such as vibration and bumps and they scatter.
- 5 e) At the point where it is presented to the consumer, the packages become loose and fall due to external factors such as wind, bumps, knocks.
- f) While the packages produced automatically with similar method by Recot patent are shaken or pulled out of the strips. There is a high risk of damage to the strips and the system of hangings. The difference is clearly noticed at FIG. 5 POS. N1, N2 and FIG. 6
- 10 POS. a0, a1, a2, and a3.
- g) In Recot Patent (which recent devoloped patent at this subject), since the strip produced gets continuously longer, the cutting process of packages containing desired number of pieces (like 10 each) is not automatic.
- 15 h) Stripping process can be started by using signals on the original circuit of the bagmaker, in a way that there is no need for a complicated system such as with step motor or micro processor (or with PLC) . Hence, the cost is low and there is no complexity.

2.d. Brief Description Of The Drawings

Figure No	Pos.No	Description
1	10	A schematic side elevational view of vertical form fill and seal packaging machines with two different application of present invention
	11-a	A vertical type form fill packing machine
	11-b	The mechanism to which package reel is connected
	11-c	Package reel
		The packing material disengaging from package reel and moving on to be formed into a package
	11-d	The rolls directing the packing material disengaged from the reel
	12	The unit to print date/code onto the packing material
	13	The tube former
	14	Vertical jaw
	15	Driving belt system that regularly leads the packing material to the jaws.
	16-a	The half-made package (tube-shaped) of packing material.
	17	Packing main jaws group
	18-a	The mechanism which the strips are connected to strip reel
	18-b	Stripping reel
	19	The counter weight that presents the disengagement of stripping reel
	20	The first main part at the station -II
	40	The conveyor which carries the stripped packages out
	41	The stripped strip
	42-b	The stripped package
	Station-I	The station at which the packing process is performed.
	Station-II	The station at which the stripping process is performed.
2	20	A perspective view of the moment when grippers caught the package.
	21	The first main part at the station-II
	22	The strip material
	23	The strip braking piston
	24	The strip pitch piston
	25	The guiding part (chute) which directs the strip material.
		The small back strip seal jaw piston to which the jaws sealing the packages to strip is connected
	26	The small front strip seal jaw piston to which the jaws sealing the packages to strip is connected.
	27	Front and back small strip seal jaws which attach the packages to the strips.
	28	Strip cutting piston
	29	Strip cutting knife
	30	The second main part at the station II.
	31	The piston which carries the packages from the 1st station-I to the station-II
	32	The forked arm which carries the package from the station-I to the station-II station.
	33	The pneumatic grippers
	34	Sensor
	35	The plate which the sensor perceives (31)
	36	The fixing profile which attach piston (31) to to the second main part (30)
3	Station-II	Perspective view of the moment when the package is attached to the strip at the station-II
4	20	The 1st main part at the 2nd station to which pitch braking and other parts are attached.
	30	The second main part to which the piston that the pneumatic grippers, arms carrying the packages from the station-I to the station-II are connected to is attached.
	24	The guiding part which makes the strip lead to sealing jaws
	32	The forked part to which pneumatic grippers are attached
	35	Perceiving plate for sensor
5	M1	Front elevational view of specially perforated cardboard strip
	M2	Side elevational view of the packages are manually attached to strip.
	N1	Front elevational view of the stripped packages made by Recol's patent.
	N2	Side elevational view of the stripped packages made by Recol's patent.
	O1	Front elevational view of the stripped packages made by present invention.
	O2	Side elevational view of the stripped packages made by present invention.
6	a0	The phases of detaching the packages from the strips produced with the stripping method and by the stripping unit that is the subject matter to the patent.
	a1	
	a2	
	a3	

2.a. Description of Background Art.

This invention related generally to system for attaching (affixing) bags to a carrier strip, especially, to a method and apparatus for detachably securing flexible bags to a display carrier strip and simultaneously affixing at the second station.

- The packing machine producing the package is illustrated in the figure 1, but the principal operating system (there are machines that have pneumatic, mechanic, hydrolic, rotatory, electro-pneumatic, electro-mechanic or electro-hydrolic operating system) is already known by the science of packing technology; thus, the details will not be defined again when explaining this invention.

- Sealing of the upper and lower ends of the packages in the horizontal and vertical type form filling and sealing packing machines is carried out and cut by the same jaw group (17). Sealing of the back parts is carried out by back jaws (14) in the vertical types and in the horizontal types the same process is performed while the package is going through 2-3 jaw groups with rotatory disks, thus the packet one end of which is sealed and the other is open like a tube (16) is ready before the product is put in.

- How to produce a small number of packages and meanwhile the application of the invention is explained below;

- Packing machines (10) have stripping reels (18-b) near the mechanism (11-a) in which normal package reel (11-b) is located.

- While packing material starting from the package bobbin is going through various (directing) rolls (11d) off center and information such as date of code is checked and printed automatically (12), afterwards the packing material goes through a special tube former and then while this material being wrapped around a pipe in accordance with the sealing method is being pulled by the jaw, it is applied to the jaws as much as the length of the package by means of frictional and vacuumed belts in the machines of some certain types.

a) Stripping bobbin is placed in the spare bobbin (18a) pin of the machine. Here, a strip having a counter weight part (19) is used in order to prevent the bobbin from turnover because of the speed inertness that occurs during operation.

b) On the first main and horizontal part are connected the braking piston (22), stroke (pitch) piston (23) and the pistons to which the sealing jaws are connected (25,26) strip leading (directing) roll and guide chute (24). The knife cutting the strip at certain lengths (by the signal it perceives) (29) and the piston to which it is connected are also connected to this part.

c) On the second main and vertical part (30) (which can be installed two different way see fig.1) - shown in Figure 4-are connected the pneumatic grippers (33) that hold the package of which all sealing processes are completed in the big main jaws along with the group of armed bars (32) to which those pneumatic gripper are connected, and the pneumatic piston (31) which causes the armed bar system to move up and down with the signal it perceives and the sensor that enables the piston to complete the cycle by making use of the position of the pneumatic piston while it is going through a certain point, and the plate (35) enabling the sensor to be perceived.

d) The package (16-b) weighed, filled and sealed at the top, bottom and back by the packing machine is held by the two reciprocal pneumatic grippers (33) of the system that is the subject matter of the patent, and is rapidly carried to the second station (this is the point where the packages are sealed to the stripe). While it is being carried Sensor (34) produces a signal by perceiving plate (35) which is connected to the arm (32) and by which the package comes down, and sends this signal to the pneumatic system which moves the sealing jaws (27). The valves receiving the signals open the sealing jaws connected to the pistons are (26) and so the pistons are put into motion. At the end of this process, the package is ready to be attached to the stripe. (The figure on Page 3).

- When the jaws (27) attach the package to the stripe, finger shaped clasps (33) are opened and they rapidly go up to the first station with their arms open in order to hold a new package.

- When they reach the first station the arms are still open. The jaws at the first station perform the sealing process, and during the cutting process the pneumatic clasps are closed by the signal coming from this process and hold the package. While the sealing jaws are opening the system carries the package to the second station During the time the

package is being carried down, the sensor sees the perceiving part and gets the sealing jaws to move. Thus the cycle goes on.

- 5 - While the jaws are coming forward, brake piston (22) is open and it allows the stripe to pass below. However, the pitch piston (23) is closed during that time. That is; the piston compresses the stripe so that its position is not displaced. Nevertheless, the jaw (27) to which the piston is connected has pulled with it as much stripe (21) as the distance way it covers while coming forward. This length is equal to the space (p) between the packages on the stripe. (It is called "pitch")
- 10 - While coming back after sealing, the braking piston(22) is closed and the pitch (step) piston (23) is open, so when the pitch piston comes forward the stripe is pulled as much as a step (p) and its position is fixed so that it can not move back-thus the the step remains unchanges. Meanwhile, the packages (42-b) on the prepared stripe stretch the stripe and keep it stretched by gravity.
- 15 - The process continues as mentioned. During those processes the package (16) is filled with the product weighed on the electronic scale located on the packing machine or it can be filled (fed) by hand.

20 The packages (42-b) which sealed (bottom, top and back) at the first station of the packing machine are automatically attached to the stripes (21) at the second station by armed clasps (33) and after being cut at certain lengths, they are poured upon the conveyor belt beneath the packing machine and with the help of the conveyor (40) the striped packages are taken out to be put into cases. Packages in cases are sent for shipping to be supplied to the market.

3. CLAIMS

- 1- Stripping the packages, produced by vertical or horizontal type fill and seal packing machines having on a carrier display strip at a second station of the same machine using the sealing method of applying heat pressure in order to attach them so that the packages themselves, the display strip and the system of hangings will not get damaged.
- 2- Apparatus as defined in Claim 1 the sealing method of applying heat and pressure to the package as shown in the figure on FIG.5 Pos. 01-02, which is the most characteristic of our invention -by means of this invention packages produced by vertical or horizontally type form fill and seal packing machines that have the ability to be adhered more safely, and more easily detached than those produced by other available systems and the packages themselves, the strip or the system of hangings are not damaged.
- 3- Apparatus as defined in Claim 1 the method of feeding the strip from opposite the small stripe seal jaw located on the opposite side of the vertical jaw (or back sealing disk can do job of vertical jaw on the horizontal type machines.) at the second station in order to have the condition mentioned in Item 2 above realized.
- 4- An apparatus according to claim 2, where in one of two strip sealing jaws, includes a guiding chute with bar and the carrier strip passes through the chute on the strip sealing jaw to a location adjacent an end of a package.
- 5- Apparatus as defined in Claim 1, the matter that the strip is able to be pulled by means of natural motion of the jaw with a direct positive effect from the system at the second station to which small strip sealing jaws and pitch piston are connected each other. (The type of the braking piston and pitch piston; mechanic, vacuumed, diaphragm, disk driver doesn't change the essence of the system.)
- 6- Apparatus as defined in Claim 1, the matter that the machine can perceive signals from the normal electric system so the system can be operated without needing an extra control system (PCL, or microprocessor etc.)
- 7- An apparatus according to Claim 1, where in at least one pair of strip seal jaw is of a plurality of mating seal elements (strip) at station-II.
- 8- An apparatus according to Claim 2, wherein said seal-forming means includes a pair of sealing jaws for forming the top and bottom seals of adjacent packages.
- 9- An apparatus according to Claim 4, where in one of the strip sealing jaws of said seal-forming means includes a guiding chute with bar therethrough for feeding the carrier strip therethrough and against a package (to front side of package.)
- 10- Apparatus as defined in Claim 1, the process in which the strips, are cut at certain lengths (when a certain number of packages are placed) after the packages are attached to the strips in order to be cased.
- 11- The method by which the strip bobbin is installed at the side where the other main bobbin is located.
- 12- The method by which the stripped packages are carried to the back side of the machine by a mobile conveyor belt passing beneath the machine. As a result, it becomes easier to reach the heated parts that need servicing frequently and reaching gets easier as well.
(However, whether conveyor belt (40) used for the purpose of transportation takes away the packages/strips from the front, back, left or right sides of the machine doesn't effect the essence of this patent.)
- 13- The method of attaching the package by means of small jaws located at the second station which is situated at the opposite side of the sealing performed by the vertical back jaw (the back sealing disks in the horizontal type machines) for the method of attaching at FIG. 5 Pos. 01 and 02 .

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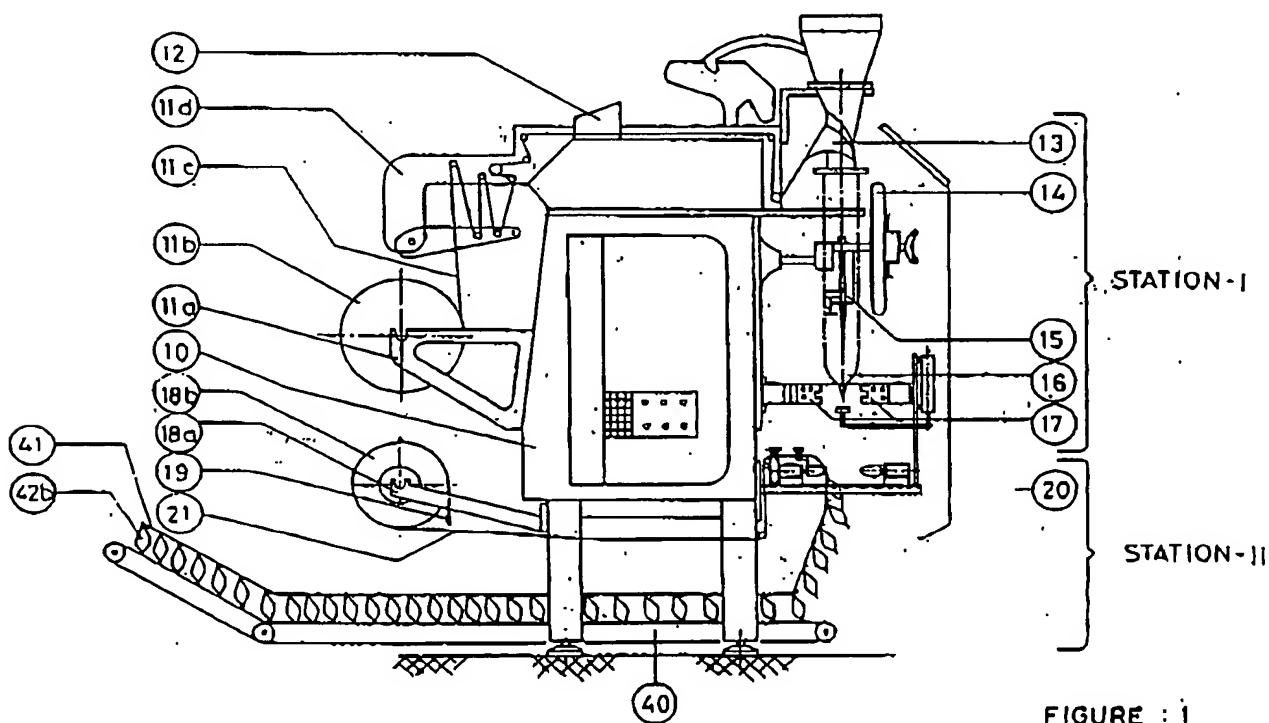
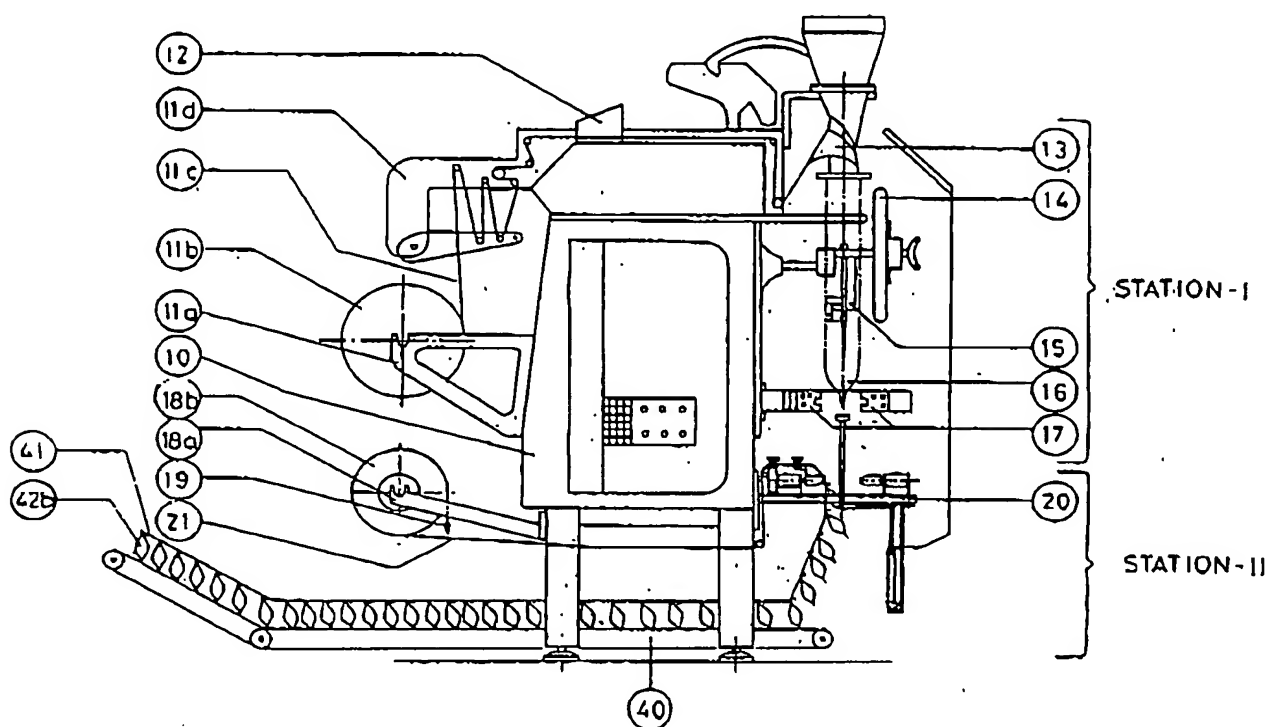


FIGURE : 1

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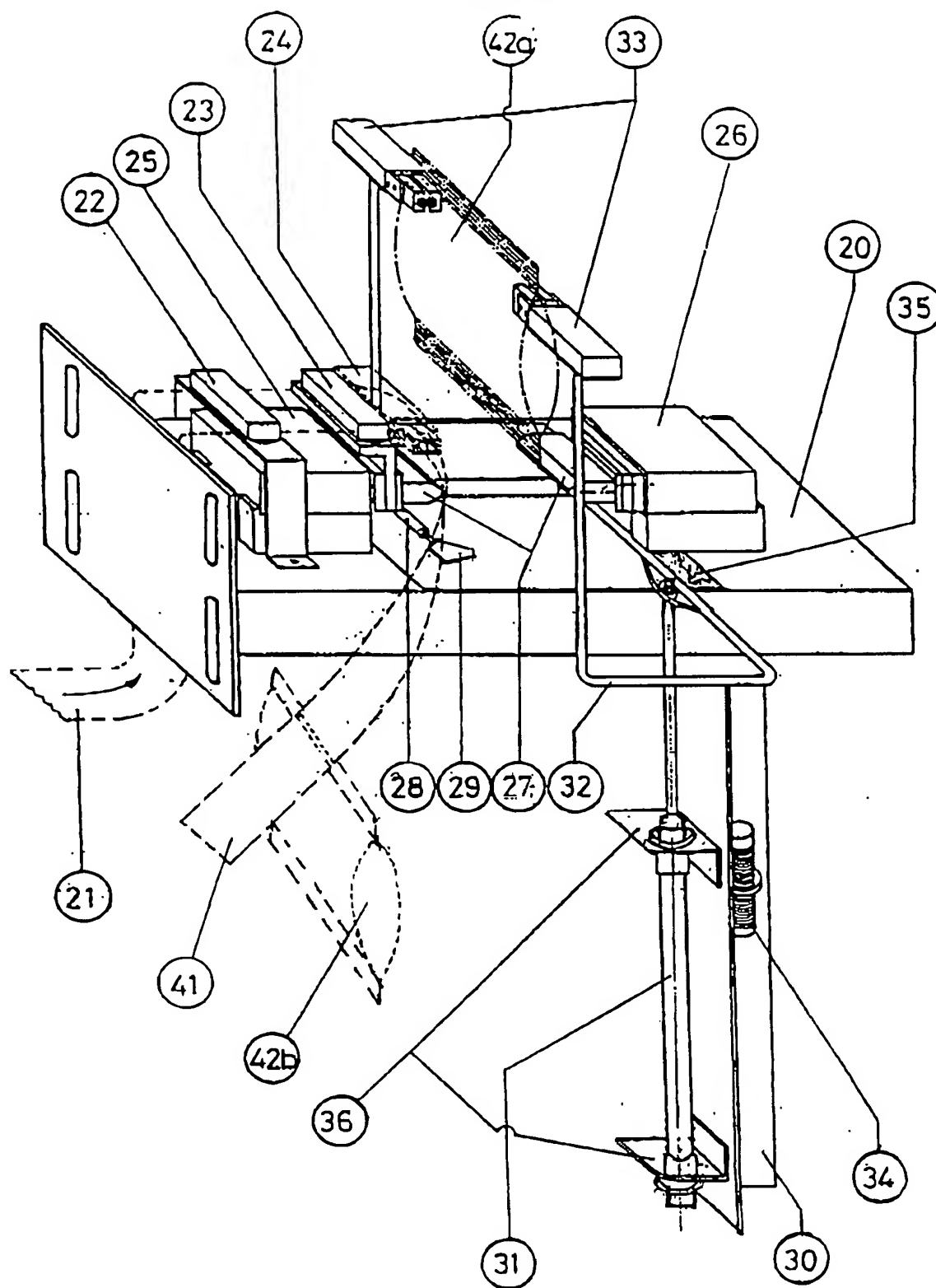


FIGURE : 2

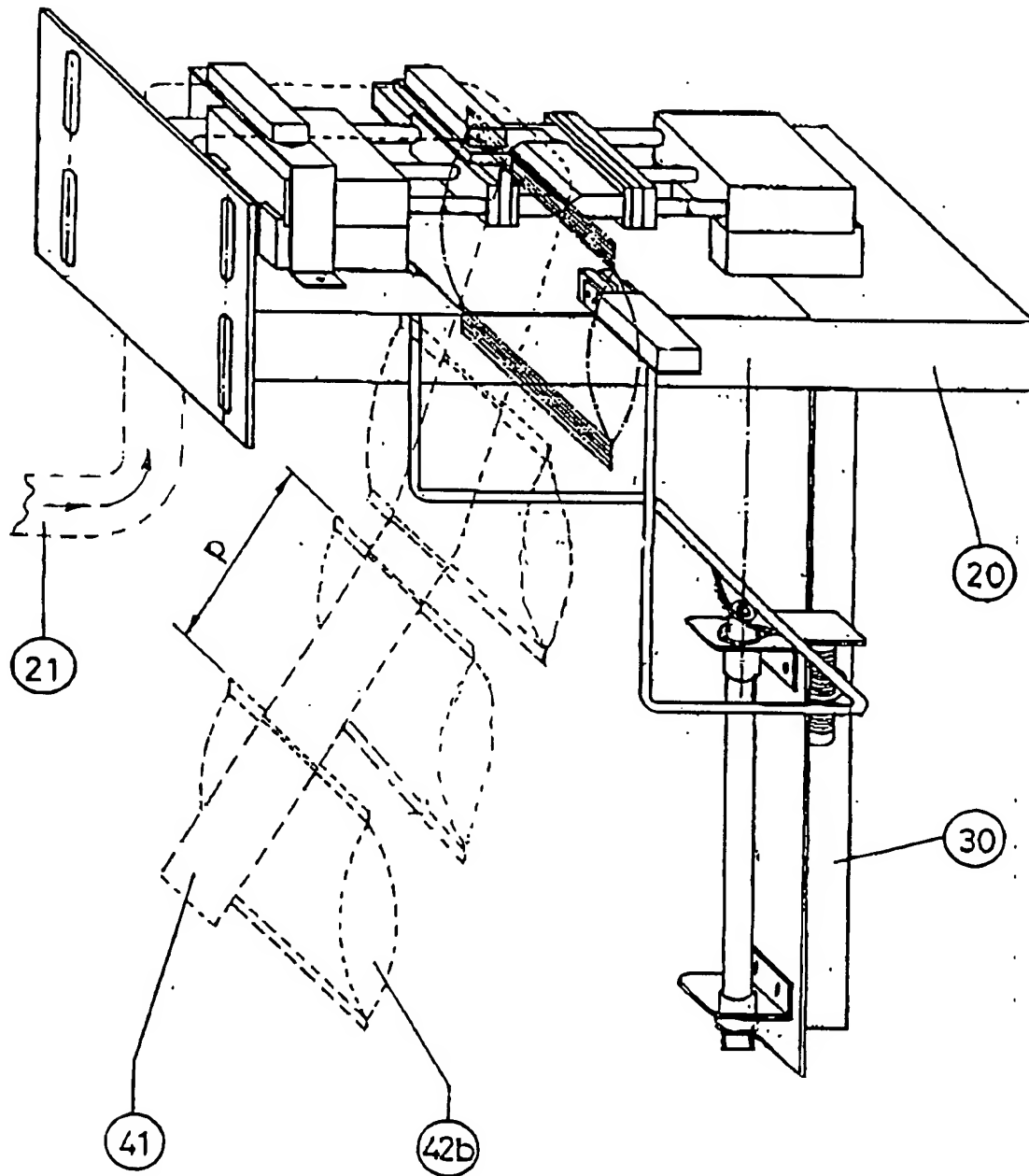


FIGURE : 3

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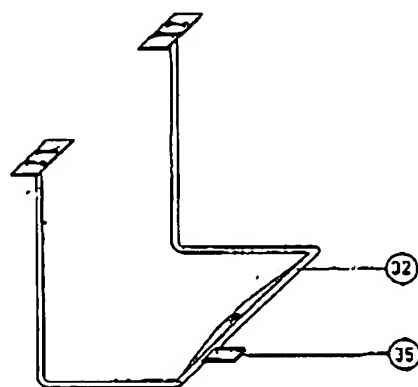
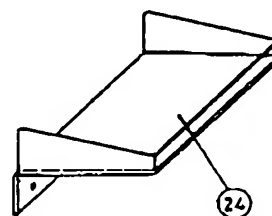
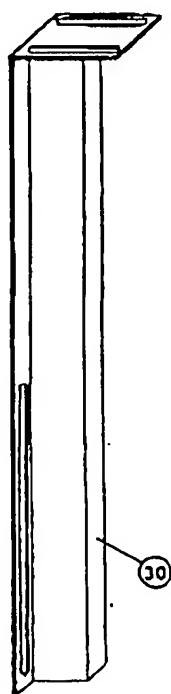
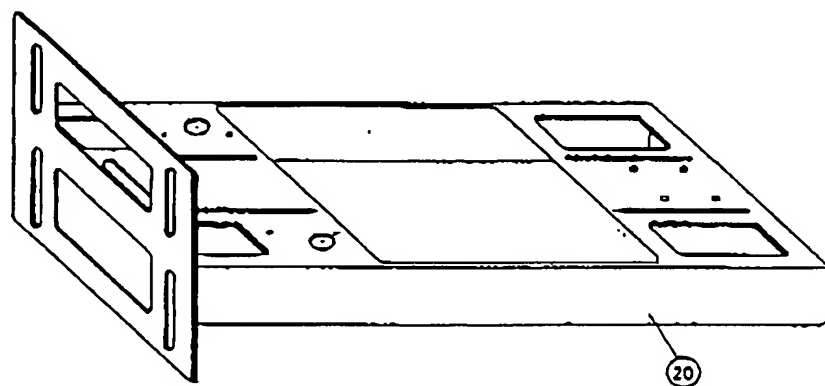
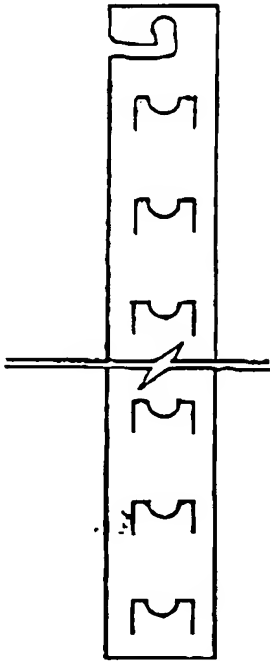


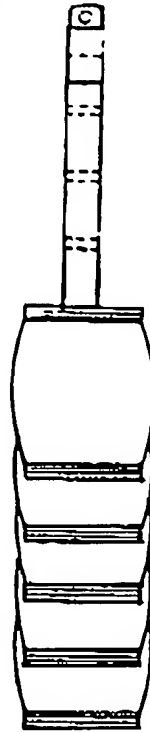
FIGURE : 4

M1

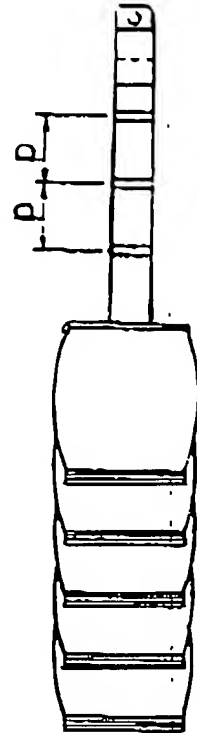


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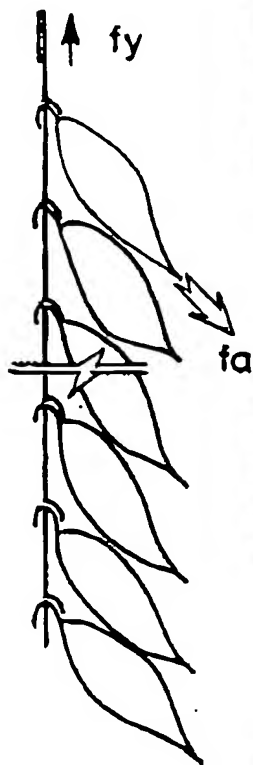
N1



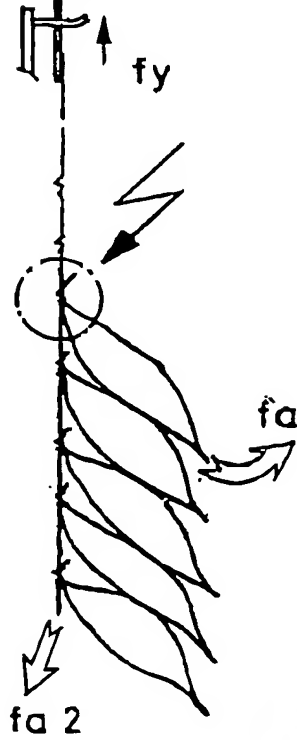
O1



M2



N2



O2

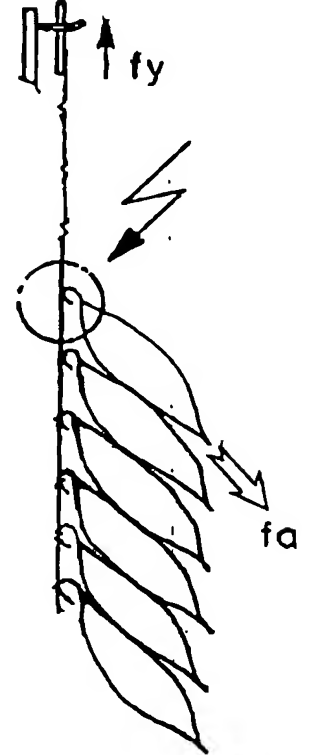


FIGURE :5

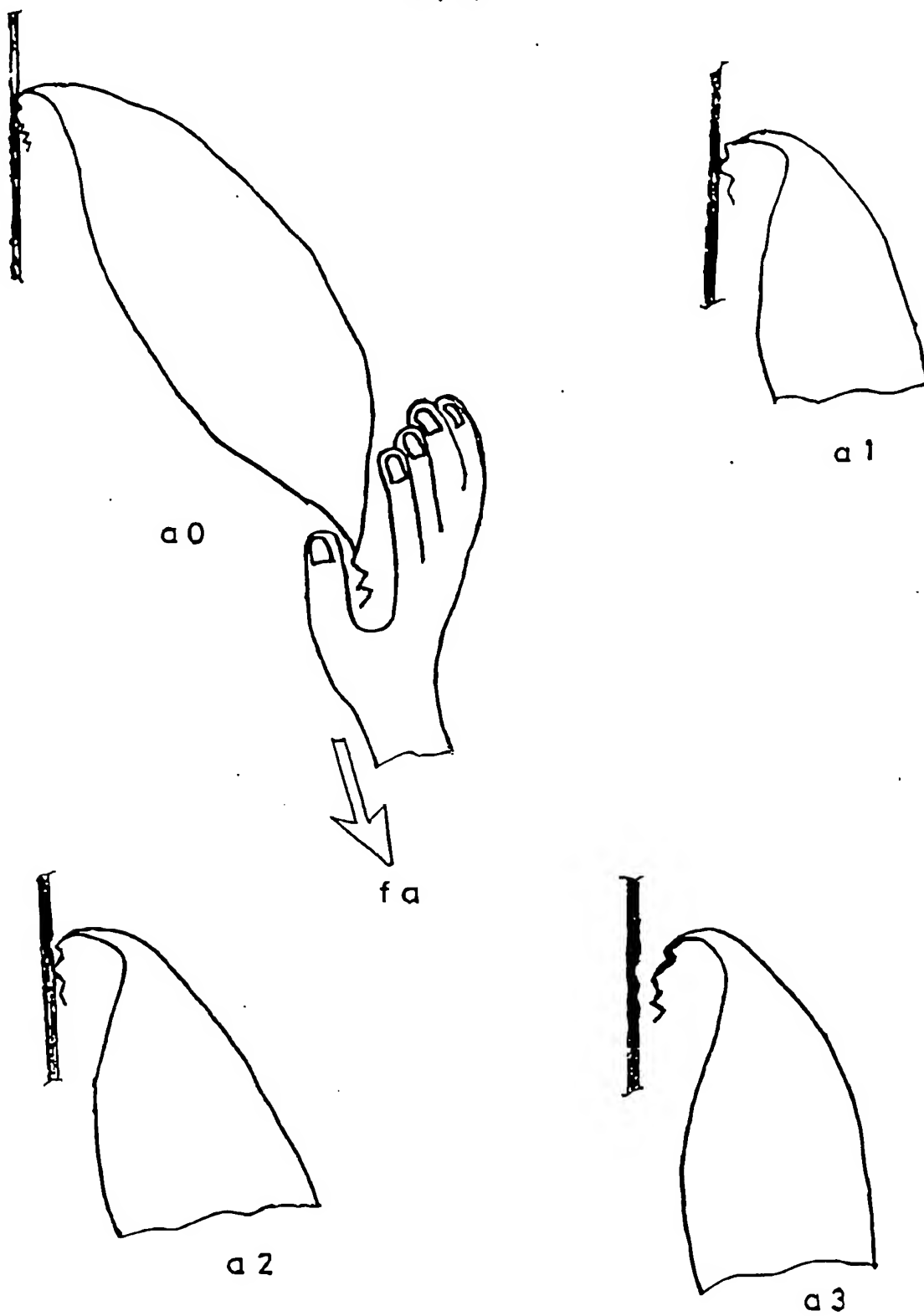


FIGURE : 6

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